

REMARKS

Claims 1 through 20 are pending in this Application, of which claims 16 through 20 stand withdrawn from consideration pursuant to the provisions of 37 C.F.R. §1.142(b). Accordingly, claims 1 through 15 are active. Claims 1, 2, 3 and 12 have been amended. Care has been exercised to avoid the introduction of new matter. Indeed, adequate descriptive support for the present Amendment should be apparent throughout the originally filed disclosure. Applicant submits that the present Amendment does not generate any new matter issue.

Claim Objections

The Examiner objected to claims 2 and 3 identifying perceived informalities and courteously suggesting remedial language. In response the Examiner's courteous suggestions have been implemented, thereby overcoming the stated bases for the claim objections. Accordingly, withdrawal of the claim objections is solicited.

Claim 1 was rejected under 35 U.S.C. 102 for lack of novelty as evidenced by Harvey.

In the statement of the rejection, the Examiner referred to Fig. 25 of Harvey, asserting the disclosure of a semiconductor device corresponding to that claimed. This rejection is traversed.

The factual determination of lack of novelty 35 U.S.C. 102 requires the identical disclosure in a single reference of each element of a claimed invention, such that the identically claimed invention is placed into the recognized possession of one having ordinary skill in the art. *Dayco Products, Inc. v. Total Containment, Inc.*, 329 F.3d 1358, (Fed. Cir. 2003); *Crown Operations International Ltd. v. Solutia Inc.*, 289 F.3d 1367, 62 USPQ2d 1917 (Fed. Cir. 2002). There are significant differences between the invention defined in independent claim 1 and Harvey's

semiconductor device that scotch the factual determination that Harvey discloses a semiconductor device identically corresponding to that claimed.

Specifically, the semiconductor device defined in claim 1 comprises, *inter alia*, contact plugs, which are adjacent to the gate electrode layer, and a side wall which is interposed between the contact plugs and the gate electrode layer. This structure is functionally significant because it renders it possible for the contact plug and the gate electrode layer to be in very close proximity, thereby enabling a dramatic decrease in the design size of the semiconductor device. This concept is alien to Harvey.

Indeed, Harvey neither discloses nor suggests a structure for a semiconductor device as in claim 1, which comprises contact plugs adjacent to a gate electrode layer with a side wall interposed therebetween. According to Figs. 19 and 25 of Harvey, dielectric 232 is formed adjacent to the gate electrode layer. Therefore, local interconnect 239(a) is **not** adjacent to the gate electrode layer. In Figs. 18 and 25 of Harvey, spacer 219 is not interposed between the local interconnect 239(c) and the gate electrode layer.

The above argued functionally significant differences between the claimed semiconductor device and Harvey's semiconductor device undermine the factual determination that Harvey discloses a semiconductor device identically corresponding to that claimed. *Minnesota Mining & Manufacturing Co. v. Johnson & Johnson Orthopaedics Inc.*, 976 F.2d 1559, 24 USPQ2d 1321 (Fed. Cir. 1992); *Kloster Speedsteel AB v. Crucible Inc.*, 793 F.2d 1565, 230 USPQ 81 (Fed. Cir. 1986).

Applicant, therefore, submits that the imposed rejection of claim 1 under 35 U.S.C. 102 for lack of novelty as evidenced by Harvey is not factually viable and, hence, solicits withdrawal thereof.

Claims 1, 2 and 13 through 15 were rejected under 35 U.S.C. 103 for obviousness predicated upon Sung in view of Yang et al.

In the statement of the rejection the Examiner admitted that Sung does not disclose a device wherein the upper surfaces of the contact plugs on the upper surfaces of the conductive parts of the transfer gates are substantially coplanar. However, the Examiner concluded that one having ordinary skill in the art would have been motivated to modify Sung's semiconductor device by forming the upper surfaces of the contact plugs and the conductive parts of the transfer gates substantially coplanar in view of Yang et al. This rejection is traversed.

There is no Motivation

In order to establish the requisite motivation, the Examiner must point to a **source** in the applied prior art for **each** claim limitation and a **source** in the applied prior art for the requisite **motivational** element. *Smiths Industries Medical System v. Vital Signs Inc.*, 183 F.3d 1347, 51 USPQ2d 1415 (Fed. Cir. 1999). More to the point, the Examiner is required to make a "thorough and searching" factual inquiry and, based upon that factual inquiry and, based upon that factual inquiry, explain **why** one having ordinary skill in the art would have been realistically impelled to modify particular prior art, in this case the particular device disclosed by Sung, to arrive at the claimed invention. *In re Lee*, 237 F.3d 1338, 61 USPQ2d 1430, 1433 (Fed. Cir. 2002). Such a factual inquiry requires clear and particular factual findings as to a specific understanding or specific technological principle which would have realistically impelled one having ordinary skill in the art to modify the particular device disclosed by Sung to arrive at the claimed invention. *Ruiz v. A.B. Chance Co.*, 234 F.3d 654, 57 USPQ2d 1161 (Fed. Cir. 2000); *Ecolchem Inc. v. Southern*

California Edison, Co. 227 F.3d 1361, 56 USPQ2d 1065 (Fed. Cir. 2000); *In re Kotzab*, 217 F.3d 1365, 55 USPQ 1313 (Fed. Cir. 2000); *In re Dembiczak*, 175 F.3d 994, 50 USPQ2d 1614 (Fed. Cir. 1999). Merely identifying wherein features of a claimed invention are perceived to reside in disparate references does not establish the requisite motivation. *In re Kotzab, supra*; *Grain Processing Corp. v. American-Maize Products Co.*, 840 F.2d 902, 5 USPQ2d 1788 (Fed. Cir. 1988). Rather, a **specific reason** must be offered based upon **facts** to support the asserted motivation--not generalizations. *Ecolochem Inc. v. Southern California Edison, Co. supra*; *In re Rouffet*, 149 F.3d 1350, 47 USPQ2d 1453 (Fed. Cir. 1998).

In applying the above legal tenets to the exigencies of this case, Applicant submits that the requisite motivation element has **not** been established. Specifically, it is firstly not apparent **how** the Examiner would propose to modify Sung's semiconductor device. **If** the Examiner is suggesting that one having ordinary skill in the art would have been realistically motivated to reduce the height of contact plugs 50 (Fig. 6B) so that their upper surfaces are coplanar with the upper surfaces of silicide 5, then a **step portion would result** leading to photolithographic irregularities. Accordingly, one having ordinary skill in the art cannot be considered realistically motivated to encounter such problems. *Panduit Corp. v. Dennison Mfg. Co.*, 774 F.2d 1082, 227 USPQ 337 (Fed. Cir. 1985).

Further, **if**, and Applicant does not agree that the requisite motivation has been established, one having ordinary skill in the art would have somehow been led to reduce the height of the contact plugs 50 so that their upper surfaces would be coplanar with the upper surfaces of the silicide layers 5, then the resulting device would **not** satisfy the claim requirement for the first interlayer insulating film to have a surface which defines the same surface as the upper surfaces of the conductive parts of the transfer gates and the contact plugs because the silicon nitride layer 6

would still be positioned on the metal silicide layer 5. *Uniroyal, Inc. v. Rudkin-Wiley Corp.*, 837 F.2d 1044, 5 USPQ2d 1434 (Fed. Cir. 1988).

If the Examiner is further suggesting that one having ordinary skill in the art would somehow have been impelled to reduce the height of contact plug 50 and eliminate silicon nitride layer 6, then Applicant submits that the requisite **fact-based realistic motivation has not been established**. This is because Sung **wants**, repeat **wants**, to position silicon nitride layer 6 on top of the gate structure in order to achieve the **expressed objective of encapsulating the polycide word lines with silicon nitride**, as specifically disclosed in the paragraph bridging columns 3 and 4 of Sung, notably column 3, lines 52-54. It is well settled that one having ordinary skill in the art **cannot** be considered realistically motivated to modify a reference in a manner **inconsistent** with the disclosed objective. *In re Fritch*, 972 F.2d 1260, 23 USPQ2d 1780 (Fed. Cir. 1992); *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984); *In re Schulpen*, 390 F.2d 1009, 157 USPQ 52 (CCPA 1968).

On page 4 of the August 4, 2003 Office Action, the Examiner concluded that one having ordinary skill in the art would have been motivated to modify Sung's semiconductor device by forming the upper surfaces of the contact plugs and conductive parts of the transfer gate substantially coplanar:

... in order to reduce the overall thickness of the device, to prevent the two adjacent gate electrodes from being shorted, to form a plug contact having a small size so that more many cells can be implement[ed] in a same chip area.

The Examiner's exposition of the motivational element does not withstand scrutiny. Firstly, Applicant questions: **Where** in the applied prior art is the factual basis for the Examiner's assertion? **Where** does the prior art **link** the asserted reasons to the absence of an insulating layer on top of the gate electrode? **What** is wrong with Sung's device insofar as overall thickness,

prevention of gates from being shorted and plug contact to justify the proposed restructuring of Sung's device? Applicant notes, that what Sung considers critical is the formation of a straight bit line shape that allows the formation of a storage node contact hold directly through the bit line shape (col. 5, line 5, et seq.). How does this objective figure into the Examiner's analysis?

Based upon the foregoing, Applicant submits that the imposed rejection of claims 1, 2 and 13 through 15 under 35 U.S.C. 103 for obviousness predicated upon Sung in view of Yang et al. is not factually or legally viable and, hence, solicit withdrawal thereof.

Claims 5, 6, 9 and 10 were rejected under 35 U.S.C. 103 for obviousness predicated upon Sung in view of Yang et al and Ozaki et al.

This rejection is traversed.

Claims 5, 6, 9 and 10 depend from independent claim 1, the patentability of which has been argued *supra*. Applicant incorporates herein the arguments previously advanced in traversing the imposed rejection of claim 1 under 35 U.S.C. 103 for obviousness predicated upon Sung in view of Yang et al. Specifically, there is **no factual basis** upon which to predicate the conclusion that one having ordinary skill in the art would have been **realistically impelled to dramatically** modify Sung's semiconductor device by forming the upper surfaces of the contact plugs and the conductive parts of the transfer gates so that they are substantially coplanar because this would either result in a stepped region or not satisfy the claim requirement for the first insulating film to have a surface which defines the same surface as the upper surfaces of the conductive parts of the transfer gates and contact plugs. Moreover, removal of the silicon nitride layer from the upper surfaces of the metal silicide portion of the Sung's gate electrodes would frustrate Sung's expressed objective of

silicon nitride encapsulation. *In re Lee, supra*. Indeed, one having ordinary skill in the art would **not** have been realistically motivated to proceed **against** the teachings of Sung by removing the silicon nitride layer from the upper surface of the gate electrodes, thereby undercutting the expressed disclosure of encapsulating the word lines with silicon nitride. *In re Fritch, supra; In re Gordon, supra; In re Schulpen, supra*. The additional reference to Ozaki et al. does not cure the argued deficiencies in the attempted combination of Sung and Yang et al.

Applicant, therefore, submits that the imposed rejection of claims 5, 6, 9 and 10 under 35 U.S.C. 103 for obviousness predicated upon Sung in view of Yang et al. and Ozaki et al. is not factually or legally viable and, hence, solicit withdrawal thereof.

Claims 7 and 11 were rejected under 35 U.S.C. 103 for obviousness predicated upon Sung in view of Yang et al., Ozaki et al. and Hsu et al.

This rejection is traversed. Specifically, claims 7 and 11 depends from independent claim 1. Applicant incorporates herein the arguments previously advanced in traversing the imposed rejection of claim 1 under 35 U.S.C. 103. The additional references to Ozaki et al. and Hsu et al. do not cure the argued deficiencies in the attempted combination of Sung and Yang et al.

Applicant, therefore, submits that the imposed rejection of claims 7 and 11 under 35 U.S.C. 103 for obviousness predicated upon Sung in view of Yang et al., Ozaki et al. and Hsu et al. is not factually or legally viable and, hence, solicit withdrawal thereof.


Applicant acknowledges, with appreciation, the Examiner's indication that claims 3, 4, 8 and 12 contain allowable subject matter. Claim 12 has been placed in independent form. Based

upon the argument submitted, *supra*, Applicant submits that the imposed objections and rejections have been overcome, and that all active claims are in condition for immediate allowance. Favorable consideration is, therefore, respectfully solicited.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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Date: November 4, 2003